

A REVISION OF ABUTILON SECT. OLIGOCARPAE  
(MALVACEAE), INCLUDING A NEW  
SPECIES FROM MEXICO

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ABSTRACT

*Abutilon* subsect. **Oligocarpae** is raised to sectional status. It was originally established when *Abutilon* was a section of the genus *Sida*. Within this section, the identities of *Abutilon pringlei* and *A. incanum* have long been confused. *Abutilon pringlei* proves to be a synonym of *A. incanum*, which grows in the Sonoran Desert and Hawaii. The species in Texas commonly known as *A. incanum* is properly named *A. fruticosum*, and does not extend into the Sonoran Desert. A key to the species of section *Oligocarpae* is given, along with full species descriptions. **Abutilon mucronatum** is described as new from western Mexico. It is distinctive because of its mucronate-tipped petals, glandular indumentum, and pungent odor.

Miller established the genus *Abutilon* in 1754. Later, Candolle, in the *Prodromus* treatment (1824), created the subsections *Oligocarpae* (with 5–8 carpels) and *Polycarpae* (with more than 8 carpels) under *Sida* section *Abutilon*. Sweet (1826) included *Oligocarpae* and *Polycarpae* under *Abutilon*, which he, like all subsequent authors, treated as a genus. His treatment, however, left unclear the rank of these subgeneric categories. Only two species included in the *Prodromus* treatment (*A. incanum* and *A. trisulcatum*) now remain in section *Oligocarpae*. The other seventeen members of his subsection have been transferred to other genera or clearly have other affinities within *Abutilon*, e.g., *A. umbellatum* (L.) Sweet and *A. giganteum* (Jacq.) Presl. *Abutilon incanum*, *A. trisulcatum*, *A. percaudatum*, *A. parvulum*, *A. malacum*, and *A. fruticosum* form a distinct and cohesive group comparable to other natural groupings within the genus, and merit recognition as a section.

**Abutilon** Section **Oligocarpae** (A.DC.) J. Fryxell, comb. et stat. nov.—*Sida* sect. *Abutilon* subsect. *Oligocarpae* Candolle, *Prodromus* 1:467. 1824.—TYPE (here designated): *Abutilon trisulcatum* (Jacq.) Urban.

Plants suffrutescent to herbaceous. Leaves cordate at base, acute to acuminate at apex, with regularly or irregularly serrated margins, canescent to tomentose throughout with fine stellate trichomes or mixed stellate and glandular trichomes. Fruits cylindro-truncate schizocarpic

capsules with loculicidal dehiscence and 3 reniform seeds per carpel; carpels 5 (6–9 in *A. fruticosum*). Chromosome base number:  $x = 7$ .

The identities and ranks of two members of this section, *Abutilon pringlei* and *A. incanum*, have been confused for many years. The epithet *incanum* previously has been applied to a taxon with yellow to orange, spreading petals, occurring from Texas to Arizona, northern Mexico and Hawaii. The epithet *pringlei* has traditionally been applied to the taxon, with yellow or pink reflexed petals each with a maroon basal spot, whose range was considered to be from Arizona to Sinaloa and west into Baja California (Kearney and Peebles 1942, Correll and Johnston 1970). Kearney (1955) treated the two taxa as separate species in his key to *Abutilon*, but noted that "*Abutilon pringlei* apparently intergrades with *A. incanum* and is probably only subspecifically distinct." Felger and Lowe (1970) merged the two taxa, recognizing two subspecies, *A. incanum* subsp. *incanum* and *A. incanum* subsp. *pringlei*, stating that "the differences for the most part involve . . . minor distinctions of color." My studies have shown that there are several other characters, e.g., petal attitude, carpel number, and leaf shape, that differ and that distinguish these two taxa consistently (Fig. 1). Their separation at the specific level is warranted. In addition, field and herbarium observations revealed that their ranges do not, in fact, overlap. As noted above, the taxon known as *Abutilon pringlei* ranges from Arizona to Sinaloa west into Baja California, whereas the taxon that has been called *A. incanum* is confined, in North America, to Texas and northeastern Mexico, with isolated populations in Oklahoma and Arkansas. In addition, this taxon is found in tropical and northern Africa, Arabia, southern Persia, Pakistan and northwestern India (Riedl 1976).

Link (1822) originally described *Sida incana* from the Sandwich (Hawaiian) Islands. Sweet transferred this species to *Abutilon* in 1826. Link did not include floral characters in his description, and the type specimen, housed in Berlin, has been destroyed. However, because there is only one taxon from this section occurring in the Hawaiian Islands, it is not difficult to determine what floral characters should be associated with the name. The taxon from western Mexico, previously known as *A. pringlei*, has, for example, the reflexed petals with a basal spot and the trichome pattern identical to that of the Hawaiian taxon (*A. incanum*) and must be considered conspecific with it. Hochreutiner described *A. pringlei* from the Sierra Tucson in Arizona in 1902. Because Link's epithet antedates Hochreutiner's, the correct name for the Sonoran Desert and Hawaiian species is *A. incanum*. The more eastern (Texas) species, to which the epithet *incanum* has been incorrectly applied, must therefore have another name. Torrey and Gray (1838) described two species, *A. texense* and *A. nuttallii*, in the same article. Both of these names were quickly recognized as synonymous (e.g., Standley 1923). My field and herbarium

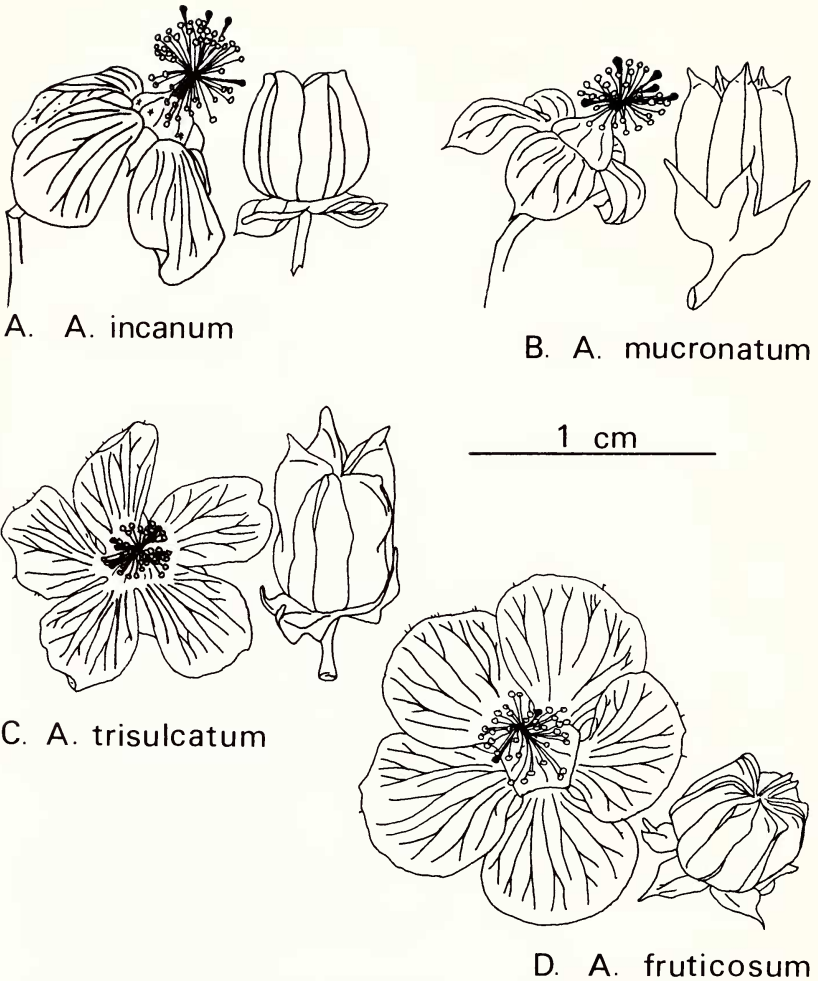


FIG. 1. Comparisons of flower and fruit characteristics for four species of *Abutilon*:—A. *Abutilon incanum*.—B. *Abutilon mucronatum*.—C. *Abutilon trisulcatum*.—D. *Abutilon fruticosum*.

studies showed that this eastern taxon conforms in all respects to Torrey and Gray's description. However, checking a bit further in the herbarium, I found that the African and Asian species, *Abutilon fruticosum* Guill. & Perr. (Guillemin et al. 1832) is identical to that described by Torrey and Gray (1838). A complete list of synonyms is included with the treatment of the species.

*Abutilon incanum*, unlike the other species mentioned in this paper, occurs down to sea level on the Pacific coast of Mexico. This must

have facilitated its dispersal to Hawaii, where it apparently arrived by natural means. Prior to 1822, ships from Mexico to the Hawaiian Islands left from Acapulco (Merrill 1954), which is quite out of the range of *A. incanum*. The fruits and seeds are buoyant, the seeds have a thick, hard coat, and the currents, as indicated by Richards (1958), favor such dispersal. Also, only the pink-petaled plants are found in Hawaii, whereas in Mexico both the pink- and yellow-petaled phases are present, possibly indicating a restricted source for the Hawaiian populations.

Field study in support of the preceding interpretations revealed that an undescribed species exists within this section. This is described below.

Key to *Abutilon* section *Oligocarpae*

- Carpels 6–9; petals cream to orange, spreading; plants covered with stellate trichomes, lacking obvious glandular trichomes . . . . .  
 . . . . . 1. *A. fruticosum*
- Carpels 5; petals yellow, pink, orange or red, spreading or reflexed; plants covered with stellate and/or simple and/or glandular trichomes.
- Plants with glandular trichomes, at least on stems.
- Petals spreading, with a dark basal spot, obtuse to rounded or emarginate at tip; fresh foliage not strongly scented.
- Young stems terete; flowers 20–25 mm in diameter . . . . .  
 . . . . . 2. *A. percaudatum*
- Young stems three-ribbed; flowers 8–10 mm in diameter . . . . .  
 . . . . . 3. *A. trisulcatum*
- Petals reflexed, lacking a basal spot, lobes mucronate at tip; fresh foliage pungently scented . . . . . 4. *A. mucronatum*
- Plants lacking glandular trichomes.
- Petals reflexed, with a well-developed basal spot, lobes obtuse to rounded or emarginate at tip; plant a diffuse shrub to 2 m high . . . . . 5. *A. incanum*
- Petals spreading, lacking a basal spot, lobes obtuse to rounded or emarginate at tip; plants either compact herbs to 50 cm high, or sprawling herbs with stems to 30 cm long.
- Petals yellow; leaves densely covered with stellate trichomes; plants erect . . . . . 6. *A. malacum*
- Petals pink to brick red; leaves covered with scattered unbranched trichomes and rarely stellate ones; plants procumbent . . . . . 7. *A. parvulum*

1. ABUTILON FRUTICOSUM Guillemin & Perrottet in Guillemin, Perrottet and Richard, Fl. Seneg. Tent. 1:73. 1832.—TYPE: Senegal, Suffal, *Leprieur s.n.* (Holotype: P).
- A. microphyllum* A. Richard, Tent. Fl. Abyss. 1:70. 1847.—TYPE:

Abyssinia, Chocho, *Petit s.n.* (Holotype: P).—*A. fruticosum* var. *microphyllum* (A. Richard) Abedin, *Malvaceae in Fl. W. Pakistan* 130:58. 1979.

*A. texense* Torrey & Gray, *Fl. N. Amer.* 1:231. 1838.—TYPE: Texas, *Drummond 43* (Isotypes: BM! OXF!).

*A. nuttallii* Torrey & Gray, *Fl. N. Amer.* 1:231. 1838.—TYPE: Texas, on the Red River, *Nuttall s.n.* (Lectotype, here designated: NY!; isolectotype: BM!).

Plants suffrutescent, 2–60 cm tall, branched from a perennial rootstock; stems terete, minutely stellate-tomentose throughout. Leaves ovate, cordate at base, acute at apex, 1–10 cm long, blade pubescent; leaf-margins irregularly serrate. Flowers solitary or in few-flowered, leafy-bracted panicles, calyx 2–4 mm long, lobes ovate, acute to acuminate at tip with bifurcated trichomes along margins; petals spreading, cream to orange-yellow, 5–10 mm long (Fig. 1D). Chromosome number:  $n = 7$  (Bates and Blanchard 1970).

*Distribution.* Dry areas on cliffs, slopes, prairies, open woodlands and chapparal, 0–1000 m; Texas, Oklahoma and Arkansas to Coahuila, Nuevo Leon and Tamaulipas in North America. Also tropical and northern Africa, Arabia, southern Persia, Pakistan and north-western India.

2. **ABUTILON PERCAUDATUM** Hochreutiner, *Annuaire Conserv. Jard. Bot. Genève* 21:438. 1920.—TYPE: San Luis Potosí: Rioverde, *Palmer 19* (Holotype: NY!; isotypes: GH! K! MO!).

Suffrutescent shrubs 5–20 dm tall; stems terete; plant glandular-pubescent throughout. Leaves ovate, cordate at base, long-acuminate at apex, 8–13 cm long; blade pubescent and glandular; margins irregularly serrate. Flowers solitary or in subpaniculate inflorescences; calyx 7–8 mm long, lobes ovate, acuminate at tip, bifurcated trichomes covering inside surface, petals spreading, cream-colored to yellow with carmine basal spot; 8–10 mm long. Chromosome number:  $n = 14$  (Bates 1976, Fernandez 1974).

*Distribution.* San Luis Potosí and Hidalgo to Chiapas.

3. **ABUTILON TRISULCATUM** (Jacq.) Urban, *Repert. Spec. Nov. Fedde* 16:32. 1919.—*Sida trisulcata* N. J. Jacq., *Enum. Pl. Carib.* 26. 1760. —TYPE: insula Domingo (no specimen cited or traced; see comment following description).—*Sida triquetra* L., *Sp. Pl. ed. ii.* 9621. 1763 (based on *S. trisulcata* Jacq.).—*Abutilon triquetrum* (L.) Sweet, *Hort. Brit. ed. i.* 1826.—*Bastardia triquetra* (L.) Morales in Maza, *Anal. Soc. Esp. Hist. Nat.* 19:218. 1890.

*A. ramosissimum* Presl, *Rel. Haenk.* 2:116. 1835.—TYPE: Mexico,

Acapulco, *Haenke s.n.* (Holotype: PR?).—*Sida ramosissima* (Presl) D. Dietrich, Syn. Pl. 853. 1847.

*A. nealleyi* Coulter, Contr. U.S. Natl. Herb. 1:32. 1890.—TYPE: Texas: Hidalgo County, near Hidalgo, *Neally 50* (Holotype: US!).

Suffrutescent shrubs, 1–20 dm tall; stems strongly 3-angled to terete in stems 2 or more years of age, glabrous to densely tomentose or glandular. Leaves ovate, cordate at base, abruptly acuminate at apex, 2–12 cm long; blade finely velvety; leaf-margins serrate to crenate. Flowers solitary or in subpaniculate inflorescences; calyx 3–4 mm long, lobes ovate, acuminate at tip, with bifurcated trichomes covering inside surface; petals spreading, yellow with red spot at base, 4–5 mm long (Fig. 1C). Chromosome number:  $n = 7$  (Bates and Blanchard 1970).

*Distribution.* Disturbed areas in south Texas, through Central America to Nicaragua and the West Indies at lower elevations.

No lectotype is designated here for Jacquin's description, because I have not yet traced a reasonable specimen. There is a good possibility that one exists, however, so I will not designate a neotype. See D'Arcy (1970) and Stafleu (1966) for information on typification of Jacquin names.

#### 4. *Abutilon mucronatum* J. Fryxell, sp. nov.

Frutex debilis ad 2 m altus aromaticissimus dense tomentosus partibus viridibus totis dense tomentosis trichomatibus glandularibus stellatis, annotinis interdum leviter porcatis, hornotinis teretibus. Folia 30–100 mm longa, 20–60 mm lata, longeacuminata, serrata, ad basin cordata. Inflorescentia paniculata diffusa foliata foliis valde reductis. Lobi calycis adaxialiter pro parte maxima glabri ad marginem trichomatibus bifurcatis ad apicem trichomatibus bifurcatis adpressis. Petala 5, recurvata, 3–5 mm longa 2–3 mm lata eburnea ad marginem roseola et interdum venis roseolis, ad apicem mucronata, abaxialiter trichomatibus sparsis simplicibus ca. 0.1 mm longis; columna staminum viridis vel leviter roseola; segmenta fructuum unumquidque 3-sperma aristata aristis 0.1–1 mm longis longitudine dehiscentia; semina fuliginea 1 mm diametro reniformes irregulariter pubescentes trichomatibus stellatis minutis (Fig. 1B).

Suffrutescent shrubs, 0–2 m tall; stems terete, young stems sometimes slightly ribbed; plant densely tomentose with glandular and stellate trichomes throughout. Leaves ovate, cordate at base, long-acuminate at apex; leaf-margins finely serrate. Flowers in diffuse, leafy-bracted panicles; calyx 3–4 mm long, inside surface glabrous, but lobes sparsely edged with bifurcated trichomes; petals recurved, cream-colored with pink margins, 3–5 mm long, mucronate at tip, abaxial

surface covered with scattered unbranched trichomes; staminal column green or faintly pink. Chromosome number:  $n = 7$  [Fryxell and Lane 7 (TEX)], (Fryxell 1980).

TYPE: Mexico, Sonora, on the road from Navojoa to Alamos, about 15 km e. of Hwy 15 (near 27°02'N, 109°30'W), 200 m. 22 Oct 1978, Fryxell and Whitacre 128) (Holotype: TEX!; isotypes: ARIZ! NY! US!).

*Distribution.* Disturbed areas with good drainage, such as roadsides and fallow fields; Sonora, Sinaloa, Nayarit, Jalisco, Colima, Michoacan, Guerrero, Puebla, and Guanajuato, 100–1500 m.

5. ABUTILON INCANUM (Link) Sweet, Hort. Brit. ed. i. 53. 1826.—*Sida incana* Link, Enum. Pl. 2:204. 1822.—TYPE: “in insulis Sandwich” (specimen housed in Berlin, now destroyed; written description here designated as lectotype).
- A. *pringlei* Hochr., Annuaire Conserv. Jard. Bot. Genève 6:14. 1902.—TYPE: Arizona: Sierra Tucson, *Pringle s.n.*, 21 Apr 1884 (Holotype: NY!; isotype: US!).—A. *incanum* subsp. *pringlei* (Hochr.) Felger & Lowe, J. Ariz. Acad. Sci. 6:83. 1970.
- A. *mochisense* Hochr., Annuaire Conserv. Jard. Bot. Genève 21:447. 1920.—TYPE: Sinaloa: near Los Mochis, *Rose 13329* (Holotype: NY!; isotype: US!).
- A. *pringlei* var. *sinaloensis* Hochr., Annuaire Conserv. Jard. Bot. Genève 21:437. 1920.—TYPE: Sinaloa, in vicin. Topolobampo, *Rose 12372* (Holotype: NY!).

Suffrutescent shrubs 1–20 dm tall; stems terete, densely covered with minute stellate trichomes. Leaves ovate, cordate at base, long-acuminate at apex, 1–10 cm long; blade densely stellate-canescens; leaf-margins irregularly serrate to crenate. Flowers solitary or in open, leafy-bracted panicles; calyx 2–4 mm long, lobes ovate, acute to acuminate at tip, with bifurcated trichomes along inner margins; petals reflexed, yellow or pink with maroon basal spot, 4–6 mm long. Chromosome number:  $n = 7$  (Bates 1976, Bates and Blanchard 1970, Carr 1970) (Fig. 1A).

*Distribution.* Dry hills and arroyos from Arizona and Baja California to Sinaloa, and (pink phase only) in Hawaii.

6. ABUTILON MALACUM S. Wats., Proc. Amer. Acad. Arts 21:446. 1886.—TYPE: Texas, El Paso, 10 Sep 1883 (on label), 1884 (in text), *Jones 4193* (here designated as Lectotype: POM!; isolectotypes: BM, BR, NY! POM!).

Compact herbs 1–10 dm tall; stems terete; plant stellate-pubescent throughout, trichomes yellowish. Leaves suborbicular, cordate at base, obtuse to acute at tip, 3–10 cm long; blade densely stellate-canescens;

leaf-margins acuminate denticulate. Flowers in compact panicles; calyx 6–8 mm long, lobes lanceolate, acute to acuminate at tip, inside surface covered with bifurcated trichomes; petals spreading, orange to yellow, 6–8 mm long. No chromosome data available.

*Distribution.* Dry hills, slopes and flats in the southern half of Texas and New Mexico, and Sonora, Chihuahua, Coahuila, Durango, and San Luis Potosí.

Watson cites 6 collections: *Palmer 2139, Harvard 8, 130; Jones 4193; Pringle 164* (GOET! K! US!), *363* (GOET! K! US!). Standley (1923) says "type from Texas." To be consistent with Standley's designation, I have assigned lectotypic status to the Jones collection because it is from Texas.

7. *ABUTILON PARVULUM* Gray, *Pl. Wright*. 1:21. 1852.—*TYPE:* Texas: calcareous hills of the San Felipe and San Pedro Rivers, *Wright (56)* (Holotype: GH!; isotypes: BM, NY! OXF! US).

Stems spreading or trailing from a woody rootstock, stems 1–30 cm long, terete; plants sparsely covered with minute stellate and unbranched trichomes. Leaves broadly ovate, 1–5 cm long, cordate at base, obtuse to acute at apex; leaf-margins coarsely dentate. Flowers solitary, axillary; calyx 3–4 mm long, lobes ovate, acuminate at tip with bifurcated trichomes present along inner margins; petals spreading, pink or red, 4–6 mm long. Chromosome number:  $n = 7$  (Bates and Blanchard 1970).

*Distribution.* Hills, dry ledges and similar areas from Texas to Colorado, California and Baja California, Sonora, Chihuahua, and Coahuila.

All five specimens of Wright's are numbered 56, but this may be a distribution number added by Gray, and not Wright's collection number.

#### LIST OF EXSICCATA

A list of specimens examined is on file at the University of Texas, and in Fryxell 1980. Additional copies are available on request from the author.

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